March 2006

What's HOT

Stay Tuned for New Research Efforts

The 2006 UTRAC Workshop is just around the corner. Scheduled for March 21, 2006 at the Salt Lake Community College Miller Campus, this workshop will bring together nearly 150 participants from UDOT and our public, academic and private sector partners to identify the top transportation research needs for Utah. John Njord will be the keynote speaker. Participants will spend most of the day meeting in nine topic-oriented breakout groups to evaluate various problem statements, determine how to best find solutions to our pressing needs, and develop a priority list of those needs. Over fifty problem statements have been submitted in advance of the workshop for consideration by these groups, in areas such as pavement management, construction processes, environmental issues, bridge and foundation design, automated traffic management, and asset tracking.

Following the UTRAC Workshop, the Research and Development Division will apply available FY07 research funds to support the highest priority projects from each of these topic groups. Each year, about $1.5 million of federal and state money is available for research efforts. Individual projects range from very small studies to efforts requiring several hundred thousand dollars to complete. Last year, 25 research projects were recommended for research funding, and most of those studies are well underway.

The UTRAC Workshop was initiated in 1993 by the Research Division as a way of getting input and feedback from a broad range of UDOT employees. Over these years, this has proven to be an effective tool for identifying our most pressing concerns. Each year, changes and improvements have been made to the process, based on feedback from participants. The changes made in 2005 garnered the AASHTO President's Award for Research. This year's workshop is expected to be another successful event. For more information about the UTRAC Workshop, contact Esther Olsen (964-4568) or Blaine Leonard (965-4115) in the Research and Development Division, or visit our Research web site.

Stay tuned...

Materials & Pavements

None

In The Know

A Look At Who We Are?

Completed UDOT Research Studies

Need a Literature Search

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Transportation Pooled Funds Review Comments

A joint review of the Federal Highway Administration (FHWA) Utah Division and the Utah Department of Transportation (UDOT) was undertaken to identify issues in the pooled fund process and to discuss improvements. The pooled fund process is complex and involves several units and individuals within the UDOT, the FHWA, and other states and partners. Nearly every pooled fund transaction involves several steps and individuals to complete. Since pooled fund projects are handled infrequently, the process is not always well understood by all the parties involved. For these and other reasons, the aim of this process review was to accomplish three things:

1. Document the processes at the state level.
2. Have those involved in pooled fund projects achieve a greater understanding of the entire process.
3. Develop tools and recommendations, and resolve issues to make the process run more efficiently.

Early on in the review, it was identified that a major step towards improvement could be made if the parties within the UDOT and the FHWA Utah Division could discuss and document their respective roles in the process, especially in terms of the financial processing of pooled fund projects. A large portion of the discussion focused on developing flow charts that described how the process worked. The discussions helped the participants understand their roles as well in the context of the entire process. During the review, potential solutions to existing issues were discussed. Tools were developed that would aid in administering the program. It is hoped that recommendations and tools will be implemented and that the process will be improved in the future.

Projects in Partnership with the Utah Department of Transportation

In 2005 the Research and Development Department of Utah Department of Transportation engaged InteliSum™ Inc.* (ISI) to perform three new projects to validate its exciting new technology.

ISI is the only company with the patented technology that fuses Light Detection And Ranging (LIDAR) XYZ coordinates, digital image (RGB) data, and geophysical position (GPS) information into every pixel. This intelligent pixel™ technology (InteliPixel™) creates Life Dimensional™ pictures (LD3™ files) that enable quick and easy capture of real world data – and fast, seamless translation into CAD.

ISI's InteliPixel technology was used on the 35th South and Bangerter Continuous Flow Intersection Project under Carter-Burgess and two sections of 47th South and 5600 West for the railroad department under Mike Seely of UDOT.

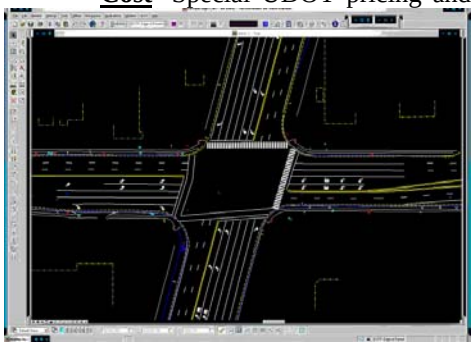
ISI delivered 3D CAD drawings in In-Roads.DGN file format to UDOT along with ISI's LD3-3D image files. These LD3 image files allowed UDOT engineers to freely navigate each captured scene on their desktop computer and pick data points for export into CAD with

ease, speed and accuracy.

The immediate benefits of the InteliPixel Technology were:

- **Safety**- No road closure was necessary and no one was put in harms way during the data capture process.

- **Accuracy**- LD3 files have survey quality accuracy in each intelligent pixel of the scene. Potentially millions of points can be picked with this same high level of accuracy.
- **Speed**- Instead of weeks for survey data to be available, only days were required. The import of the LD3 data into CAD is 75% faster than with point cloud data. And best of all, site revisits to collect more data are not required.
- **Cost**- Special UDOT pricing and substantial cost savings over traditional survey methods made this a highly cost effective project.



ISI and UDOT are working with the Department of Public Safety to apply the LD3 technology to accident investigations. ISI is also currently working on road projects in California, New Mexico, Southern Utah, West Virginia and Idaho.

ISI has been approached by Skidmore, Owens and Merrill to use their technology for documenting the construction of the new World Trade Center. Other ISI projects in the queue are: Ship building for General Dynamics, Bridges for Seattle DOT and Mine safety for the Mining Safety and Health Administration.

For more information about ISI please contact Lori at: (801) 924-0660 ex. 120 ldemorest@intelisum.com ; www.intelisum.com ; info@intelisum.com . For more information about UDOT please contact: Shana Lindsey rlindsey@utah.gov

* ISI is formerly known as RappidMapper Inc.

Upcoming Events

The ongoing Technology Transfer Program is a crucial aspect of our business. Every month we ask an expert and hold a session on hot topics within UDOT. The following is the List of upcoming sessions

Date	Subject	Presenter (s)	Division
03/30/06	Design Exception/Design Wavier/Deviation from UDOT Standards Process	Richard Miller, Steven Anderson, Barry Axelrod	UDOT Engineering Services
04/20/06	PCS Database	Bill Lawrence, Russ Scovil	System Planning and Programming
04/27/06	Pioneer Library Services	Craig Neilson	Utah State Library
05/04/06	Roadway Design, Manual of Instructions	Richard Miller, Steven Anderson, Patti Charles	UDOT Engineering Services
06/28/06	Measuring Maintenance Performance	Lynn Bernhard	Maintenance Planning Division

Washto-X Videoconferencing Sessions

Date	Topic	Host Site	Place
04/11/06	Incorporating Safety Improvements in Resurfacing & Rehabilitation Projects	Caltrans	Lester Wire Library and will broadcast to Region One, and Region 4 Richfield
05/09/06	Products Evaluation Program	TBD	Lester Wire Library and will broadcast to Region One, and Region 4 Richfield
06/13/06	Safety Measures in School Zones: Speed Limits, Access Points, & School Routing Plans	TBD	Lester Wire Library and will broadcast to Region One, and Region 4 Richfield

If you would like to know more about these sessions, please contact Abdul Wakil awakil@utah.gov or 801-964-4455.

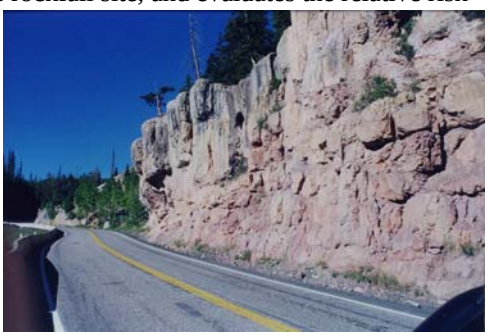
Geotech/Maintenance

Danger-Rocks in the Road

Rocks in the road can be a hazard for motorists along Utah highways, and a nuisance for UDOT maintenance crews. Over the past several years, the UDOT Research Division has been working with the Geotechnical Division to identify and prioritize these numerous rockfall locations.

The Utah Rockfall Hazard Rating System (RHRS) is a Microsoft Access database, which contains location and description data about every rockfall hazard along our state roads. This data was gathered over several summers by graduate students at Utah State University, based on interviews with each of UDOT's maintenance sheds and site visits to quantify the characteristics of each fall location. If our shed personnel have ever had a rockfall, the site is listed in the database, along with the size of the rocks that fall, the frequency of occurrence, and the nature of the slope. This information is combined with highway geometry, ADT, roadway classification, and other data. A total of 1102 sites are included in the database, with detailed data included for the 507 most significant sites.

To make the database a useful tool for planning, a rating system has also been included. The rating formula considers all the significant characteristics of the rockfall site, and evaluates the relative risk at each site. The risk scores allow the sites to be prioritized in order of criticality, by Region. This formula was based largely on a system developed in New York, after consideration of two systems in Oregon, the New York system, and several others. It was customized for use in Utah by Dr. Robert Pack, of Utah State University. The rating formula uses Visual Basic for Applications. ArcGIS capabilities are also included in the system, so that rockfall locations can be seen on a map. The Technical Advisory Committee who managed the project included Keith Brown, Leslie Heppler, Jon Bischoff, Grant Gummow, and Darin Sjoblom, all of the Geotechnical Division, Clifton Farnsworth and Blaine Leonard, from the Research Division, Chris Glazier from ETS, and Richard Giraud from the Utah Geological Survey. Larry Pierson, a rockfall expert from Landslide



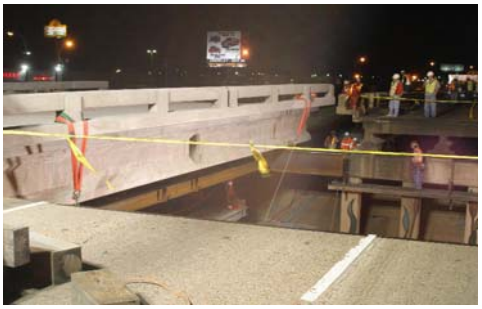
Technologies in Oregon, served as a consultant. So, which rockfall sites are the most critical? The top sites according to this evaluation are: MP 473.4 along US89 (Logan Shed) in Region 1, MP 6.48 along SR190 (Cottonwood Shed) in Region 2, MP 26.05 along SR92 (Provo Canyon Shed) in Region 3, and MP 8.1 along SR14 (Cedar City Shed) in Region 4. The software doesn't evaluate potential mitigation or repair cost, so the most critical slopes may not be the first to be repaired. In fact, a practical repair may be unattainable. But, the prioritized listing will allow the Regions to make better decisions on the use of maintenance and repair funds, and prevent problems more effectively. Better tools for transportation tomorrow.

For more information on the Utah RHRS, please contact Leslie Heppler, of the Geotechnical Division, at 801 965-4318 or Blaine Leonard, of the Research Division, 801 965-4115.

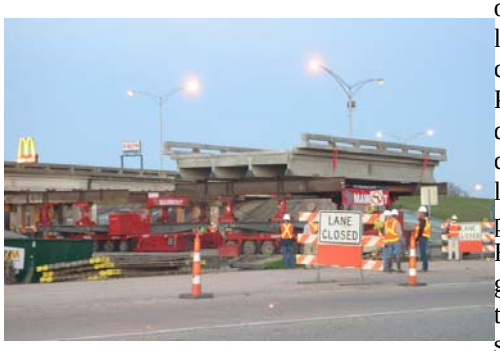
Structures

Prefabricated Structures Scan Tour

On January 2006 the Utah Department of Transportation (UDOT) Project Development Team took a group of general contractors to Lafayette, Louisiana in order to watch a Prefabricated Bridge Systems (PBS) installation. This is the second phase of the UDOT PBS study funded by Innovative Bridge Research and Construction Fund. As can be seen in the photo below, on this project an entire bridge span was lifted into place as a single unit.



During the first phase, UDOT visited New York and New Jersey, in fall of 2005 to evaluate PBS design and construction. In both tours, the team met with state DOT officials and local contractors.



Prior to these two scan tours, UDOT performed PBS design and construction at three selected sites. The construction work was completed in 2004. Lessons learned from these projects have been documented and presented to all Regions, Central office, AGC, and FHWA. Designers and construction folks have learned a great deal about what can be done better. Because of this experience, many questions were raised prior to the selection of the scan tour destinations.

The two scan tours have helped UDOT construction engineers, bridge design engineers, project managers and general contractors to understand the PBS concepts and the UDOT PBS initiatives. The UDOT Research Division has been assigned to develop a decision-making flow chart for the PBS selection process. The chart will produce consistency of PBS decision making for both rural and urban locations. The purpose of the chart is to remove most of the personal preference concerning the use of PBS and generate uniformity of understanding throughout the Department. One of the major changes, which will be evident in the decision-making chart, is that all future structural designs will require general contractors on board before the design starts. PBS selection and design will have general contractor input throughout the process. The PBS decision-making flow chart has been completed and is ready for implementation. For more information about the scan tour, please contact Daniel Hsiao of the UDOT Research Division at dhsiao@utah.gov

A Look At Who We Are

An ongoing feature of our quarterly newsletter is an introduction to one of our Research and Development Division staff member. In this edition, we will introduce to you Mr. Ken Berg. Ken is

the current Development Engineer in Research and has been with UDOT for almost fifteen years and eight years of that in Research and Development. His major responsibilities include working with Barry Sharp and Debbie Heim on Experimental Features in the categories of Pavement Markings and Messages, Asphalt and Concrete Pavements, Bridge Deck Corrosion Monitoring, and Delineators, working on developing a WEB based GIS tool to improve reporting data to our customers. Ken is also supporting the Pavement Marking QIT by collecting and compiling pavement marking retroreflectivity data. Ken supports Barry Sharp and Debbie Heim in New Products. If you need information about the above, please contact Mr. Berg at 801 965-4321 or kenberg@utah.gov.

New Members of the Research & Development Division?

Mumtaz is our new Library/Technology Transfer Technician. He has been with UDOT for a little over a month. His major responsibilities include managing and supervising all library functions and providing great customer services to UDOT. Mumtaz is a graduate of University of Utah with a Bachelors Degree in Political Sciences and currently perusing a Masters Degree in Business Administration (MBA).
Mr. Mullahkhel is always willing to help and answer your questions about library functions. If you are in need of any information, please contact Mumtaz at 801-965-4626 or mmullahkhel@utah.gov

Completed UDOT Research

Research publications are our valuable resources. For a list of recently completed Research Projects, please visit the Research & Development website at: http://www2.udot.utah.gov/index.php?m=c&tid=235 . If you would like to obtain an electronic copy or a printed copy of our completed research, please contact awakil@utah.gov

Need a Literature Search?

The UDOT Research Division and Lester Wire Library provide an important service through literature searches. These searches help identify published information about a topic of interest. To request a search, provide a brief description and some key words and submit it to awakil@utah.gov. or mmullahkhel@utah.gov. Also submit your request online at http://www.udot.utah.gov/index.php/m=c/tid=895/

National Transportation Library | TRIS Online v2.7 Search Entry | TRB Transportation Research Board

Please send comments and questions about this newsletter to Abdul Wakil awakil@utah.gov